FORSYTH BARR

Electricity Sector

Calling RIO's Bluff

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We are calling Rio Tinto's (RIO) bluff that closure of its NZAS aluminium smelter at Tiwai Point near Bluff is imminent without more favourable terms. Fundamentally its actions make little sense in the context of climate change and minimising carbon emissions. This paper reviews NZAS economics, looks at its position within RIO's portfolio and within global aluminium smelters, and considers the four possible outcomes from RIO's strategic review. We retain our view that NZAS will remain open, although whether RIO remains a 79% owner is another question.

Long-term future secure if a global price is placed on carbon

NZAS's long-term future should be secure. We estimate that a global carbon price of ~US$16/tonne is enough to shift NZAS into the lower half of the aluminium cost curve. This is because coal-fired power stations emit significant quantities of carbon. The current carbon price in New Zealand is ~US$19/tonne and in Europe it's higher still. With 61% of the world's aluminium production coal-backed, NZAS is in a strong position long-term. If RIO were to close NZAS, it would lose the option value associated with NZAS remaining open.

A sale is far more likely than closure

We believe a sale is far more likely than closure as fundamentally we do not believe there are no buyers. In the past three years RIO has sold (or almost sold) its European smelters, so deals are being done. Arguably, RIO paying a third party NZ$200m to take NZAS off its hands is a better outcome than closure. In addition, a sale fits the facts better than closure.

High on the cost curve due to the electricity contract, but NZAS doesn't fit the profile of recently closed assets

We estimate that NZAS is at the 93rd percentile on the cost curve. Whilst that is not great, we still believe NZAS is profitable based on ~75% of its production being "value-added" product and RIO's disclosed 2019 product premium vs. the LME aluminium price being +19%. In addition, all smelters that have closed in recent years (that we could find) are significantly smaller than NZAS and most use fossil-fuel electricity. NZAS does not fit the profile of recently closed aluminium assets.

No change to underlying views — closure is highly unlikely

There is no change in our underlying view that NZAS will remain open. Whether it's RIO owning it or someone else, we are less certain. Our current electricity generator/retailer valuations assume (conservatively) a 20% chance of closure, with the value impacts less than 5% (on a weighted basis). We do assume Meridian Energy (MEL) lowers its electricity price -$13m and Contact Energy (CEN) -$5m.

RIO's strategic review is expected to be completed by the end of March 2020, assuming it sticks to its timetable.

Investment View

We have a positive long-term view on the electricity sector. In our view the closure risk of NZAS is small and even if it were to close, the impacts on the electricity sector (in the long-term) should not be material. Our preferred stocks are CEN and Genesis Energy (GNE), which have OUTPERFORM ratings. We are NEUTRAL on MEL, Mercury (MCY) and Trustpower (TPW).

Aluminium smelter economics

Aluminium smelters are part of a long supply chain to produce aluminium products. Aluminium is smelted from alumina, which in turn is refined from bauxite.

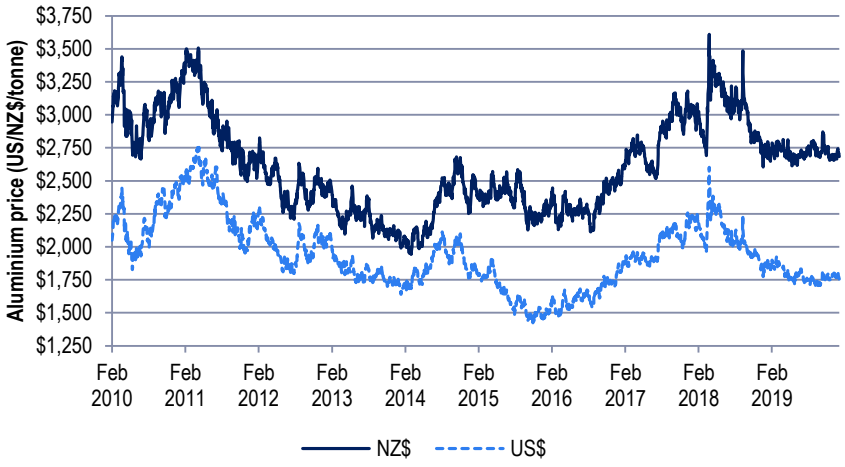
To produce one tonne of aluminium requires:

- ~Two tonnes of alumina (~four tonnes of bauxite is required to produce one tonne of alumina)
- ~15MWh of electricity
- Carbon cathodes and anodes (~0.4 tonnes of carbon)
- Electrolyte

Aluminium prices — unpicking the NZAS premium

LME aluminium prices are volatile and have ranged between ~US$1,500 and US$3,500/tonne over the past decade. For much of the past year, aluminium prices have fluctuated around US$1,750/tonne (NZ$2,700/tonne).

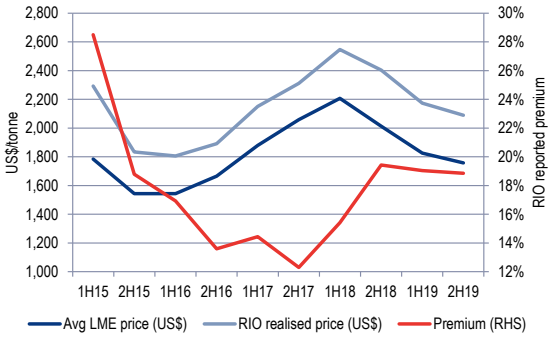
Figure 1. Historic aluminium price



Source: IRESS, Forsyth Barr analysis

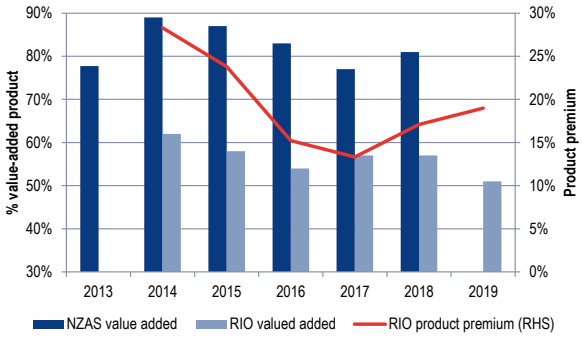
One of the key variables in the profitability analysis is the size of premium that NZAS receives above the LME price. However, it is also the variable that is hard to get a clear picture of. RIO has reported that in 2019 its group average aluminium price received was US$2,132/tonne, a premium of +19% (US$340/tonne, NZ$515/tonne) above the average LME price. 51% of RIO's 2019 sales were "value-added" aluminium products.

Figure 2. RIO vs LME market price



Source: RIO, IRESS, Bloomberg, Forsyth Barr analysis

Figure 3. RIO value added premium



Source: RIO, NZAS, Forsyth Barr analysis

Whilst we do not know the exact premium that NZAS receives, we know it sells more "value-added" product than the RIO group on average. In 2018, 81% of NZAS's aluminium products were classified as "value-added" and over the six years from 2013 has averaged 82%. In comparison, RIO reports its aluminium division has sold between

50% and 60% for the past 5 years, with the recent sale of its Dunkerque plant pushing the percentage of value-added products towards 50%.

In our analysis we assume NZAS received a premium of 17% (~US$300/tonne) in 2019, which appears conservative relative to RIO's disclosed statistics.

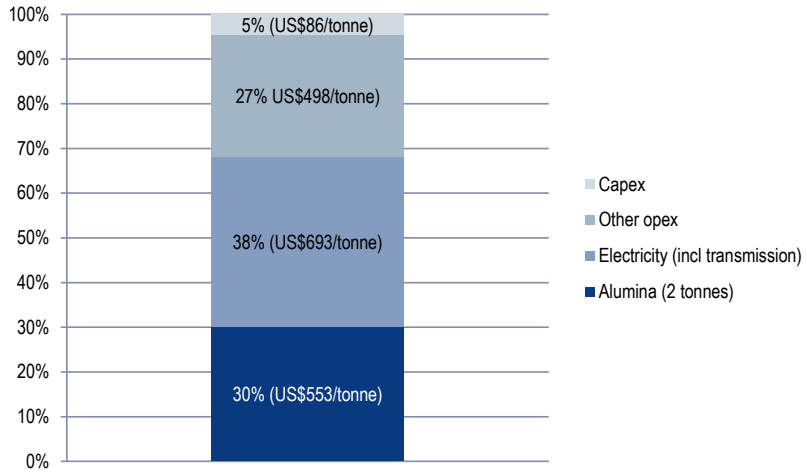
Breaking down NZAS costs — electricity is typically the biggest

We estimate that NZAS's operating costs (incl average maintenance capex) is US$1,830/tonne.

For NZAS, electricity (energy + transmission) represents ~38% of the total cost of production, its highest individual cost. Whilst there are some efficiency variances, most aluminium smelters require between 14.5MWh and 16.0MWh of electricity to produce a tonne of aluminium (although we note that the Chinese smelters average 13.6MWh/tonne — which seems very low). Excluding China, the global average electricity efficiency is 15.1MWh/tonne (14.2MWh including China). NZAS averaged 14.85MWh/tonne in 2018.

Given the importance and cost of electricity, aluminium smelters are often located close to "cheap" reliable sources of electricity. Many smelter owners own electricity generation plant as it reduces price risk from one of their most important costs and typically unit generation costs are lower than market prices. When NZAS was originally built in 1971, the original intention was for the smelter owner to also own the Manapouri power station that was built at the same time. Comalco pulled out of that agreement and the Government of the day instead built the power station and so began the seemingly never-ending haggling over an appropriate electricity price.

Figure 4. NZAS production cost breakdown



Source: NZAS, Forsyth Barr analysis

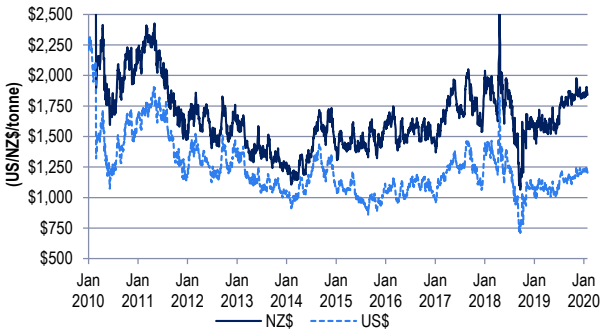
Alumina costs are currently the next biggest single cost for smelters, with the current alumina market price of US$275/tonne implying costs of US$550/tonne of aluminium. Alumina costs should be roughly the same for all smelters globally, although there are vertically integrated operations such as RIO where the economics will differ. That said, when looking at a stand-alone smelter the relevant cost is the market cost of alumina. Alumina prices have been volatile over the past four years, with the period prior to mid-2015 relatively stable.

The aluminium less alumina spread has been less volatile, with a range of between US$750/tonne and US$1,750/tonne for most of the last decade. The current spread of ~US$1,250/tonne is very close to the decade average.

Figure 5. Historic alumina prices

Source: Bloomberg, Forsyth Barr analysis

Figure 6. Historic aluminium - alumina price spread



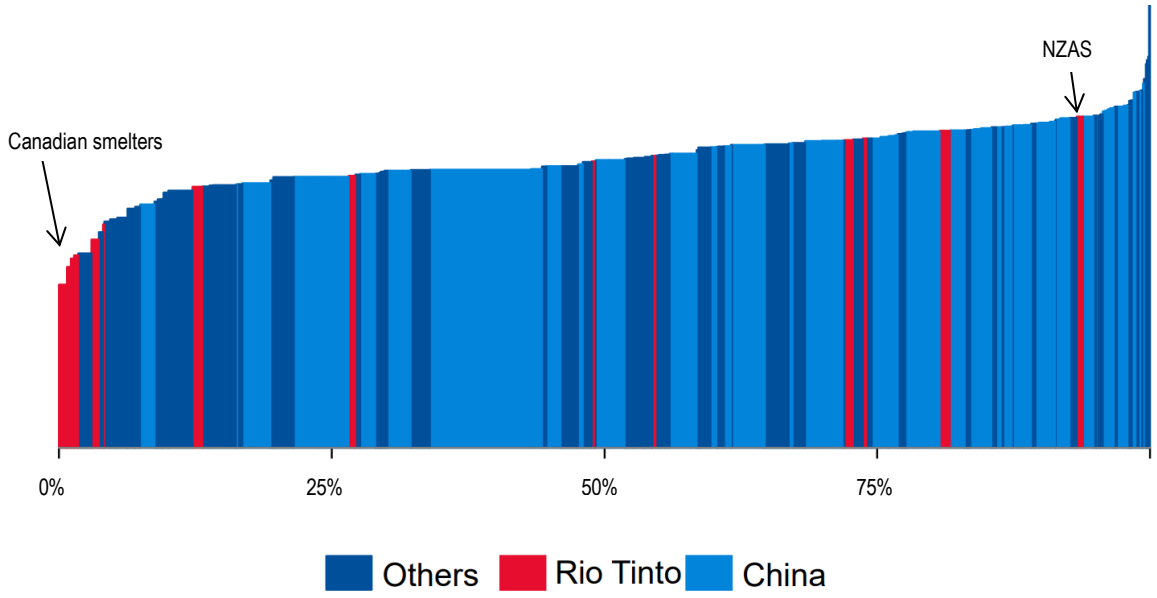
Source: Bloomberg, Forsyth Barr analysis

Other operating costs and capex costs will vary to some extent between smelters, depending on the scale of the smelter. NZAS is a medium sized smelter in global terms.

NZAS current costs vs. other smelters

We estimate that NZAS's operating costs are ~US$1,830/tonne. In global terms that is quite high. There are differing views on NZAS's position on the cost curve, however, we believe that it is the highest cost smelter that RIO owns and sits at the ~93rd percentile. Whilst the ~93rd percentile is not a great position for NZAS to be in, we do not believe NZAS's position is as dire as it sounds.

Figure 7. Aluminium production cost curve

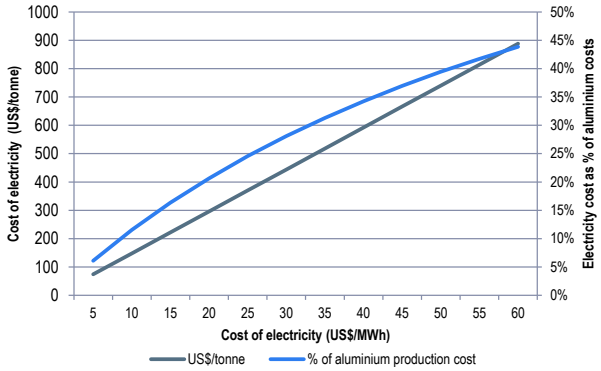


Source: RIO, Forsyth Barr analysis

In our view, RIO's cost curve chart is slightly misleading as electricity costs are not compared consistently. RIO's Canadian aluminium smelters are the lowest cost in the world because it owns the hydro generation stations used to produce the aluminium. We believe RIO is using the actual cost of generation, which for hydro is very low (typically less than US$5/MWh). The difference between hydro operating costs and the all-inclusive electricity price that NZAS pays equates to ~US$600/tonne. If RIO used the market price of that electricity (on the basis that it could theoretically close the smelter and sell the electricity instead), we suspect its cost curve analysis would look very different.

Electricity costs are the single most important determinant of where an aluminium smelter sits on the cost curve. We estimate that the difference between NZAS's costs and the 50th percentile is US$240/tonne, which is the equivalent of ~US$16/MWh (~NZ$24/MWh, NZ$84m) — in the scheme of things that is not significant.

Figure 8. Electricity cost converted to cost/tonne of aluminium



Source: NZAS, Forsyth Barr analysis

Figure 9. Estimated cost percentiles

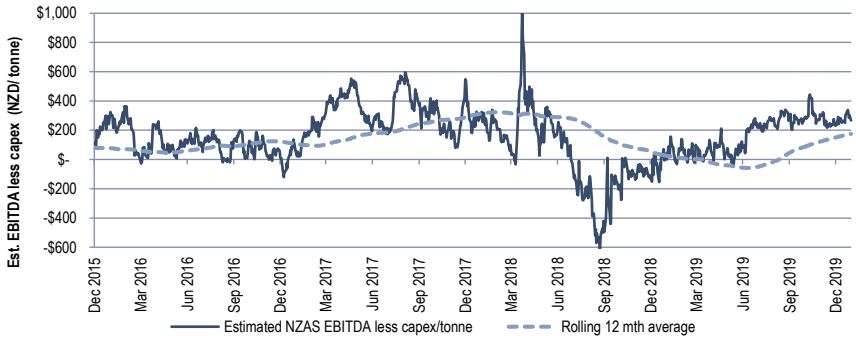
Percentile	Cost of production	Diff to NZAS		
	US$/tonne	US$/tonne	US$/MWh	NZ$m/annum
Min	892	938	63	328
25th	1,498	332	22	116
50th	1,590	240	16	84
75th	1,704	126	9	44
NZAS (93rd)	1,830	0	0	0
Max	2,459	-629	-43	-220

Source: NZAS, Forsyth Barr analysis

Estimated profitability remains positive, although there was a difficult period in late 2018

Our analysis is that the current profitability of the smelter remains positive and over the last six months EBITDA less capital costs has averaged ~NZ$275/tonne, with the 12-month rolling average just under NZ$200/tonne. However, as we noted earlier, a critical assumption is the level of premium NZAS received for its value-added aluminium. At current costs, the break-even premium is ~10% (vs. our 17% assumption).

Figure 10. NZAS profitability



Source: NZAS, Bloomberg, IRESS, Forsyth Barr analysis

The short-term picture — gradually increasing aluminium prices

China is the critical factor in the aluminium market, both in terms of demand and supply. Whilst visibility on China is limited, consensus forecast for aluminium prices is a gradual improvement from the current spot price of US$1,722/tonne to average US$1,848/tonne (+7%) in 2020, with the bare estimate US$1,750/tonne.

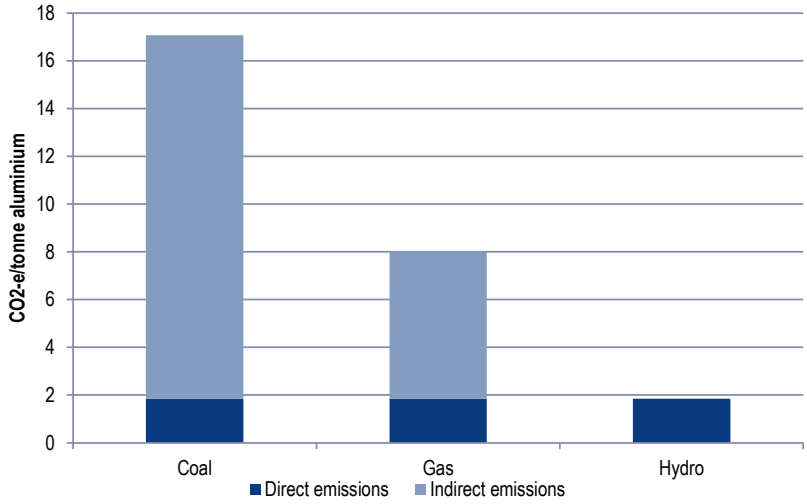
The long-term picture — the increasing importance of carbon prices

The price of carbon and whether there will be an international carbon price is of critical importance. In our view, a global carbon price means NZAS will remain operational for a very long time to come.

Direct CO_2-e emissions from smelting aluminium is typically a little under 2 tonnes/tonne of aluminium. However, with current technology using a broadly similar process, the direct CO_2-e emissions do not vary greatly from smelter to smelter.

Indirect emissions predominantly come from the electricity generated that is used in the smelting process. The difference in CO_2-e emissions from the different forms of electricity generation is material. Coal-fired generation has the highest emissions intensity at ~15 CO_2-e tonnes/tonne aluminium.[1]

Figure 11. CO_2-e emissions/tonne smelted

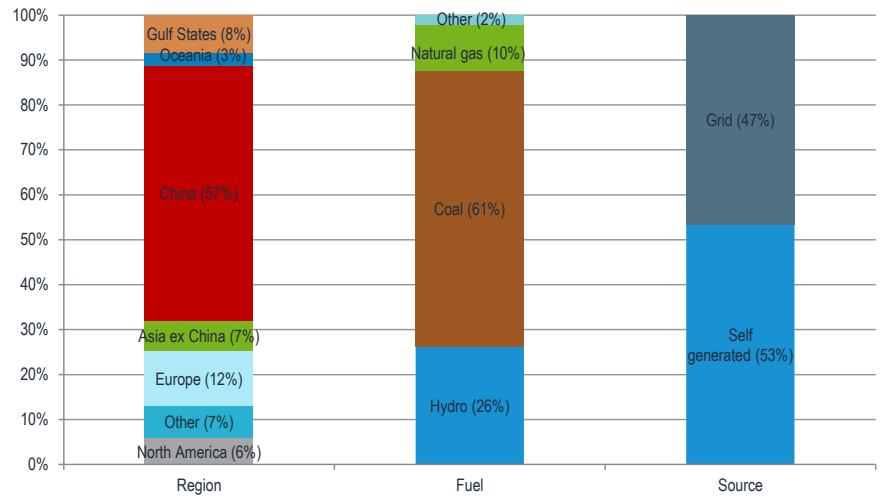


Source: Forsyth Barr analysis

The most common form of electricity generation to support aluminium production is coal (61%), followed by hydro power (26%) and natural gas (10%). China, the world's largest aluminium producer (~57%) is also the largest coal-user, with 90% of its aluminium production sourced from coal. Asia (ex-China) and Australia are the other large coal users.

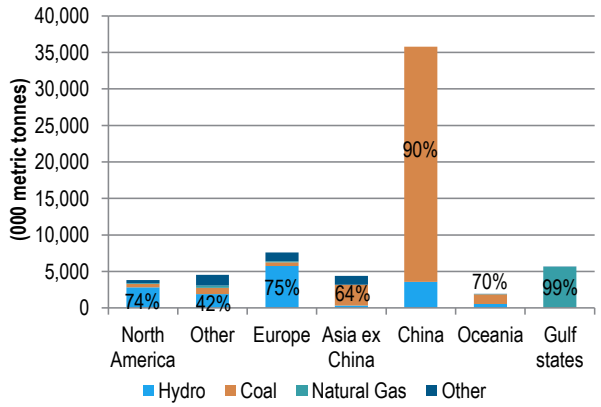
[1] The exact amount carbon emitted from coal generation depends on the type of coal used and the efficiency of the electricity generation plant. We have used Genesis Energy emission data for its Rankine units as a basis for calculation. However, we note that the Rankine units burn higher quality coal than average, meaning emissions will be lower than average.

Figure 12. Global smelting breakdown



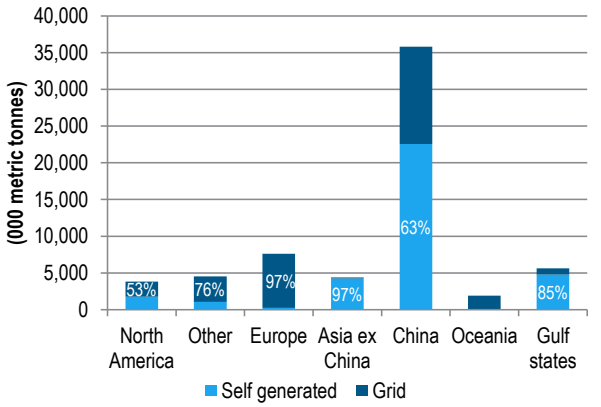
Source: International aluminium institute, Forsyth Barr analysis

Figure 13. Regional use of energy type



Source: International aluminium institute, Forsyth Barr analysis

Figure 14. Regional use of energy source



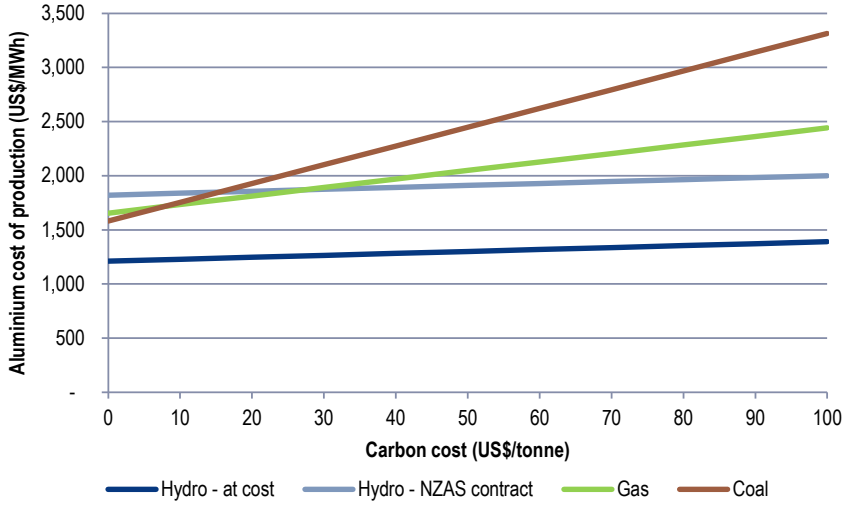
Source: International aluminium institute, Forsyth Barr analysis

A global price on carbon will dramatically change the aluminium costs curves. We estimate that a US$16/tonne (NZ$24/tonne) carbon price is enough to move NZAS to the 50th percentile (all other things being equal). Where carbon is traded, current carbon prices are already above that level. The NZ carbon price is ~$US19/tonne and the European carbon price is higher still at ~US$26.5/tonne.

Whilst NZAS will always appear more expensive than aluminium smelters that also own their own hydro generation, it does not need a particularly high global carbon price before it is one of the lowest-cost aluminium smelters, simply because its electricity is hydro-backed.

In addition, new aluminium smelters tend to be backed by fossil fuels — building new hydro eletric is globally getting harder for environmental reasons. Furthermore, other forms of renewable generation, wind and solar, are not ideally suited to aluminium electricity demand because of their intermittency. In short — current hydro-backed aluminium smelters have long-term value in a carbon constrained world.

Figure 15. Cost of production at various carbon costs



Source: Forsyth Barr analysis

Planned Chinese emission trading scheme (ETS) of critical importance

With China being the largest aluminium producer globally, and with most of that aluminium produced using coal generation, what China does is of critical importance to the aluminium market. However, information is scant.

The International Carbon Action Partnership (ICAP) indicates that following a period of simulated operation in 2019, a cap and trade system will begin auctioning units at some point in 2020 — although it appears that is far from certain. The scope of the ETS is the power sector, including captive power plants of other sectors (such as aluminium). However, with free allocation of units based on emissions intensity, there is concern about the effective of the scheme. Initial carbon prices are expected to be around US$5/tonne, well below international comparators.

That said, it is a start. In addition, with Europe threatening at the 2020 Davos meeting import tariffs on carbon-intensive products that do not face a carbon price in the country of production, the trend is only towards pricing carbon.

Whilst it is impossible to say whether there will be an international carbon price (and if so, when), in our view it is getting increasingly more likely, and given the rising sense of urgency around climate change, sooner rather than later.

NZAS within the global context/Australasian/RIO context

Global overview of aluminium smelter capacity

Compared to the largest smelters, NZAS is small with its 365k tonne annual capacity less than a third of the largest smelters. However, it is not sub-scale and is larger than both the median and average smelter size. The largest smelters are all fossil-fuel backed (either coal or gas), so whilst they have economies of scale advantages, a global carbon price will undo some of those benefits.

Figure 16. Global aluminium production

	Number	Total Capacity (000 tonnes)	Min (000 tonnes)	Average (000 tonnes)	Median (000 tonnes)	Max (000 tonnes)
China	137	37,407	35	273	210	1,100
Asia (ex China)	21	7,944	61	378	258	1,750
Gulf States	6	5,105	360	851	740	1,040
Europe	42	11,108	24	264	170	1,540
North America	16	4,783	130	299	270	606
South America	8	2,789	106	349	460	485
Africa	5	1,895	100	379	320	720
Oceania	5	2,075	180	413	365	590
Total	**240**	**73,094**	**24**	**305**	**229**	**1,750**

Source: International aluminium institute, Forsyth Barr analysis

Note: The list from which this data is produced is not exhaustive and has been cross-checked where possible. Whilst there are likely to be omissions and errors, we believe it provides a good overview of the aluminium smelting capacity.

Oceania & RIO smelters

NZAS is one of five Oceania aluminium smelters, with two other Australian smelters having closed in the past decade. It is the largest hydro backed smelter, with the Tasmanian Bell Bay smelter ~60% of the size.

RIO owns (or has a substantial stake) in 14 smelters around the world — mainly in Canada, with Australia the second largest geographic location. Most of the Australasian smelters are at least partly owned by RIO, with the Alcoa owned Portland smelter in Victoria the only Australasian smelter without any RIO involvement.

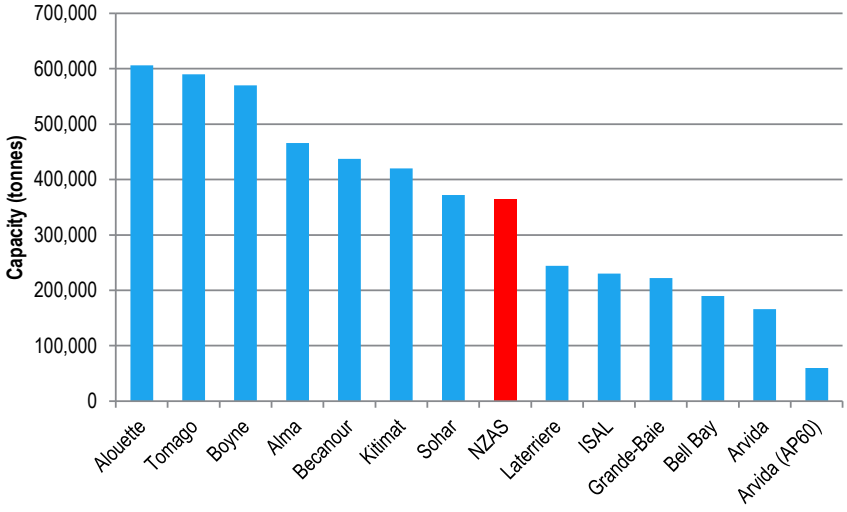
In terms of age, NZAS was built in 1971, but is not the oldest in RIO's portfolio — that honour goes to Arvida in Canada, built in 1954.

Figure 17. Oceania & RIO aluminium smelters

Smelter	Location	Capacity (000's tonnes)	Established	Refurbished	Power plant	Power type	RIO Ownership
Oceania							
NZAS	New Zealand	365	1971		Grid	Hydro	79%
Bell Bay Aluminium	Australia	190	1955		Grid	Hydro	100%
Boyne Smelters Limited	Australia	570	1982	1995, 2012	Owned	Coal	59%
Tomago Aluminium	Australia	590	1983	2001	Grid	Majority coal	52%
Portland (Aloca)	Australia	360	1986		Grid	Coal	0%
Canada							
Alma	Canada	466	2000	2016	Owned	Hydro	100%
Alouette	Canada	606	1989		Owned	Hydro	40%
Arvida	Canada	166	1954		Owned	Hydro	100%
Arvida (AP60)	Canada	60	2013		Owned	Hydro	100%
BC Works-Kitimat	Canada	420	1954	2016	Owned	Hydro	100%
Becanour	Canada	437	1986		Owned	Hydro	25%
Grande-Baie	Canada	222	1980		Owned	Hydro	100%
Laterriere	Canada	244	1989		Owned	Hydro	100%
Other							
ISAL	Iceland	230	1969	2014	Grid	Hydro	100%
Sohar	Oman	372	2008		Owned	CCGT	20%

Source: Company reports, Forsyth Barr analysis

Figure 18. RIO aluminium smelters



Source: RIO, Forsyth Barr analysis

Renegotiating electricity contracts a standard strategy

Threatening closure is not a new tactic. The vast amounts of electricity that aluminium smelters consume means closure would result in asset stranding risk in the electricity sector — providing smelter owners with a prima facie strong bargaining position. In addition to NZAS, two other Australian smelters are also in negotiations with power suppliers/State Government.

Portland aluminium smelter

The Portland aluminium smelter produces ~300,000 tonnes of aluminium per year, and uses ~10% of Victoria's electricity. Portland has only survived in recent years due to Government subsidies, and is now facing closure once again. The subsidies were given in 2017, both to counteract the high energy prices that the smelter was facing at the time, as well as rescue the smelter after a power blackout had caused the molten aluminium to solidify. As part of the contract when receiving state funding the smelter agreed to stay open until 2021 but with that now fast approaching it is likely Portland will either close or stay in a "subsidy cycle" in its current profitability state.

Bell Bay negotiations

RIO is engaged in discussions with the Tasmanian government and Hydro Tasmania around a power price cut of more than 30 percent in order to keep its Bell Bay aluminium smelter in operation. The power price cut would apply to the last 5 years of Bell Bay's 2025 power supply contract. Bell Bay is similar to NZAS in terms of location from alumina supply and using predominantly hydro-electricity, but it is just over half the size in terms of production.

What is RIO playing at?

The actions of RIO have puzzled us. For a company that purports to be climate conscious and wanting to reduce carbon emissions, closing NZ Aluminium Smelters (NZAS) does not, in our view, make logical sense. RIO's strategy over the past few years has increasingly focussed on low emission aluminium. It has branded low carbon emission aluminium RenewAl and in conjunction with Alcoa has developed a new aluminium production process ("Elysis") that is carbon emission free.

RenewAl

NZAS produces its aluminium under the RIO RenewAl brand. To qualify as RenewAl the whole production process needs to be externally ASI certified, which means it produces no more than four tonnes of carbon dioxide/tonne of aluminium. ASI certification tracks production from bauxite mining, through the refining and smelting, all the way to value added products and aluminium recycling.

On its website, NZAS highlights its climate friendly credentials, stating:

> "NZAS has one of the lightest carbon footprints per tonne of aluminium of a smelter anywhere in the world. We are proud to have our metal marketed under the new Rio Tinto RenewAl brand. Under this umbrella, NZAS can take advantage of international demand for greener, more sustainable, low-carbon products".

Interestingly Bell Bay does not make similar statements, hence, we assume it does not meet the RenewAl brand criteria.

Elysis

Elysis is a joint venture (JV) between Rio Tinto and Alcoa. The JV is being sponsored by the Canadian Government, the Government of Quebec, and Apple. Apple has just purchased the first allocation of the carbon free aluminium. Commercialisation of the technology is expected to be available by 2024. The new technology aims to eliminate all direct greenhouse gases from the smelting process and instead produces pure aluminium. The Elysis production facility is currently based in Quebec but has the ability to be retrofitted to existing smelters. Hydro powered smelters are likely to be favoured as renewable energy is necessary for it to be a carbon free smelting process.

We also note that, RIO CEO, Jean-Sebastien Jacques and NZ Prime Minister Jacinda Adern met at the 2019 Davos World Economic Forum and discussed the potential for Elysis technology to be retrofitted to NZAS. Jacques is quoted as saying "*we had a very productive meeting with Prime Minster Ardern to discuss how the carbon-free smelting technology we are testing could further strengthen New Zealand's aluminium industry, particularly in a carbon constrained world*".

There is little doubt that climate change is a core issue for consumers, voters, politicians, investors and corporates alike and is receiving increasing focus. Given that backdrop, aluminium smelters that source electricity from renewable forms of electricity should trump non-renewable forms. Whilst the economics today may favour non-renewable electricity backed aluminium, a global carbon price will change that equation quickly.

Four possible outcomes

Notwithstanding the fact that RIO's public statements only suggest staying open or closure, we believe there are four possible outcomes from the strategic review.

1) NZAS closes
    A. With one year's notice
    B. Gradually over several years
2) NZAS reduces capacity to 450MW
3) RIO sells its 79% stake in NZAS
4) NZAS continues with the status quo

We look at each of these four options in more detail.

NZAS closure

RIO is more serious about closing NZAS than it has been in the past. Whilst it has often threatened closure if it did not get a favourable change in its electricity contract (or a Government hand-out), this is the first time it has taken the step to undertake a strategic review. Taking such a step is not a trivial matter, as it unsettles the work force and risks losing staff whilst the strategic review is completed.

That said, we have sympathy with RIO's stated strategy of owning only low cost operations (i.e. operations where RIO also owns the electricity generation plant). This a common goal for businesses exposed to commodity prices as it protects them from economic downturns.

Smelters that have closed are typically small producers with high emissions

Highlighting the importance of a competitive electricity contract, many of the shuttered smelters have attributed the reason for closing as the inability to negotiate a competitive power deal amidst torrid market price conditions for primary aluminium. However, an extreme example is Aluminij Mostar which simply had its power cut off due to its failure to make payments for its power supply.

Figure 19. Closed smelters

Smelter	Country	Capacity (000 tonnes p.a)	Established	Closed	Power source
Aviles & La Coruna (Alcoa)	Spain	93 and 87	1959 and 1961	2019	Grid
Aluminij Mostar	Bosnia	106	1975	2018	Thermal and hydro from grid
Rockdale (Alcoa)	USA	150	1952	2017	Coal
Centruy Aluminium Virginia	USA	180	1957	2015	Ohio grid, mostly coal
Shawinigan (RIO)	Canada	100	1942	2014	Hydro
Point Henry (Alcoa)	Australia	192	1962	2014	Coal
Richards Bay, Bayside (South 32)	South Africa	100	1970	2014	Grid
Ormet Hannibal	USA	270	1958	2013	Grid
Kurri Kurri(Alcoa)	Australia	180	1969	2012	Coal
Lynemouth (RIO)	England	175	1974	2011	Biomass
Beauharnois (RIO)	Canada	52	1943	2009	Hydro

Source: Company reports, Forsyth Barr analysis

All of the smelters closed are relatively small, with the largest being Hannibal in Ohio, USA with a capacity of 270,000 tonnes, although it was only operating at 90,000 tonnes at the time of closure. NZAS would be the largest smelter to close on this list (and we have not found an example of a larger smelter).

Only two of the closed smelters used hydro-electricity, and both of those are the smallest two smelters on the list above and were built in the 1940s — NZAS in comparison is at mid-life and is huge. That said, both Shawinigan and Beauhamois were RIO smelters, so RIO has experience closing smelters.

The Shawinigan smelter, which still operates a casting house after RIO sold it to Groupe Soterm-Maltech, closed after RIO initiated a strategic review that "explored every option for continuing smelting operations". However, due to dated technology and weak aluminium prices, it was decided to shut down the smelter. This sounds similar to the strategic review that RIO has ongoing at NZAS with RIO having said "*the review will consider all options, including curtailment and closure*". Although with Shawinigan only having production capacity of 100,000 tonnes opposed to Tiwai's 365,000 we believe that closure is far less likely in this instance.

Closure costs

When Alcoa shut its Point Henry smelter the closure costs were said to total AU$250million after tax, which were for restructuring-related charges. The closure came just two years after the Australian government had granted Alcoa an AU$40million grant in order to help guarantee the viability of the smelter going forward.

Treasury estimated in its November 2019 report, that full closure would have remediation costs and hedge contract termination costs of at least NZ$290million. That is not dissimilar to our estimate of ~NZ$340m which is based on NZAS's FY18 financial statements provision.

Gradual closure more likely than a sudden stop

If NZAS were to close, we believe a gradual managed closure of the smelter is more likely that a sudden stop. It would be a far easier process to manage from a staff, logistical, and probably, environmental, perspective. This is positive for MEL and CEN (and the other electricity participants) as it enables the electricity sector to also adjust to the loss of demand.

Reducing capacity to 450MW

One of the possible outcomes is reducing capacity to 450MW. This has some appeal as one of the pot-lines requires ~$60m of capex work in the near future. Reducing capacity would defer the need to undertake this capex.

However, in our view this is an unlikely outcome. Reducing capacity would lower NZAS's maximum annual production ~-26% to ~265,000 tonnes, reducing NZAS's economies of scale. If NZAS is finding the economics challenging at full capacity, we doubt the economics will improve by reducing capacity. However, it provides some option value to NZAS to defer the capex and return to full capacity when conditions are more favourable (although once moth-balled there is additional cost to bring back a pot-line).

Reasons why we believe a sale is a strong possibility

Whilst RIO did not specifically list sale as a possible outcome of the strategic review (which in itself is a little unusual as a "strategic review" is typically used by corporates to say a business unit is up for sale), we see a sale as a strong possibility. The key reasons supporting a sale include:

1) Closing appears to be contrary to RIO's actions elsewhere — it has in recent years been pushing low carbon aluminium (RenewAl branded aluminium, Elysis).

2) Selling is economically more palatable than closure — RIO even paying someone $200m is better than closing, given the high site rehabilitation costs.

3) RIO is in the best position to renegotiate electricity contracts. A new buyer wouldn't credibly be able to push for a better electricity contract (and in any case the current contract will be factored into the transaction price). Saying a sale was a possible outcome of the strategic review also weakens RIO's negotiating position as closure becomes less likely.

4) RIO placed a surprisingly short time period, ~five months to renegotiate its contracts. Previous negotiations have taken materially longer to complete.

5) In past negotiations, the Australian based RIO team negotiated the electricity contracts, including the major 2013 revisions. However, this time more senior RIO officials are involved, including Aluminium Chief Executive, Alf Barrios.

6) RIO's Australasian aluminium smelters have been up for sale in the past decade. We suspect the lack of a sale points to RIO's view that smelters have significant value as much as a lack of buyer interest. i.e. RIO was unwilling to sell the smelters at any price

7) Single aluminium smelters have been transacting in the past decade, so there are buyers in the market. In the past few years, RIO has (almost) sold all of its European smelters, with its Iceland smelter sale falling through. Nevertheless, the sales highlight there is value in old, small aluminium smelters, and only the Lochbear smelter had a power plant attached to it.

Figure 20. Sold (and almost sold) RIO smelters

Smelter	Aquirer	Cost	Capacity (000 tonnes)	Power source	Other assets sold	Country	When
ISAL	Norsk Hydro	US$345m	230	Hydro/Geothermal	53% stake in Dutch Anode facility and 50% stake in Swedish AL fluoride plant	Iceland	EU commission blocked sale Sep-2018
Dunkerque	GFG Alliance (Liberty group)	US$500m	284	Nuclear	Foundry	France	Dec-18
Lochaber	(SIMEC) Liberty group	£330.00	48	Hydro	Hydro plant 145mw on average yearly	Scotland	Dec-16

Source: Company reports, Forsyth Barr analysis

Fundamentally we struggle to believe that there is not a single party interested in owning NZAS — which RIO's public statements imply.

Remaining open, with RIO as owner, remains our base case scenario

We are retaining our base case scenario that NZAS remains open with RIO as the owner. The latest push to lower electricity costs is most likely RIO rolling out the standard play-book again.

As noted earlier, our analysis is that the current profitability of the smelter remains positive and over the last six months EBITDA less capital costs has averaged ~NZ$275/tonne.

A key factor against closure (other than the significant closure costs) is the loss of option value if it were to close. If NZAS closes, and the NZ electricity market adjusts as expected to the loss of demand, there is no coming back. And in a world where reducing carbon is increasingly important, a decision to close now would appear to be very short-term focussed, cutting across much of RIO's low-carbon rhetoric.

The Sumitomo factor and ultra-high purity aluminium

RIO only owns 79% of NZAS, with Japanese company Sumitomo owning the other 21%. We do not know what Sumitomo thinks of potential closure, but given its ownership stake is all about access to ultra-high purity aluminium, it is likely to prefer continued operation of NZAS. As a significant buyer of ultra-high purity aluminium (and presumably a significant customer of RIO), we believe Sumitomo is likely to have significant influence over RIO's final decision.

RIO has indicated to Sumitomo that it is able to supply it with high purity aluminium from elsewhere in its portfolio. However, it may not be that easy. A Springer (2014) research paper "Very High Purity Aluminium: An Historical Perspective" notes:

> "*Many of the enablers to the production of Very High purity ingot were there at the beginning, and a number of these key enablers have been slipping away as our industry has been modernised, especially since the late 1970s*".
>
> and
>
> "*To this day, the older, smaller, reduction cells generally are dedicated to production of Very High purity metal. This is not to say that it is impossible for large, modern cells to produce such metal grades. But the ability to capture production units of High purity ingot slips away as batch sizes increase*".

The paper concludes:

> "*As the decades have passed, the designs of new smelters have changed to become more automated and more cost effective. The capital costs and operating costs associated with pursuit of High purity and Very High purity grades are often too high of an entry fee compared to options to pursue other value-added products that are not as demanding on metal purity.*

> *This evolution has placed some legacy pot lines and smelters in a unique situation. They are more likely to be able to remain competitive for a longer period of time by being able to produce metal grades that large, modern pot lines cannot…. By taking advantage of older technology, applying some key countermeasures, and fostering a "purity mindset", it is quite likely that some cells from the middle of the 20th century will carry Very High purity ingot production well into the 21st century…"*

Looking at RIO's portfolio, the only smelter that appears to fit the criteria noted above (built pre-1980 and relatively small) is Bell Bay.

Political considerations

Pragmatic solution possible

RIO has been in talks with not only the electricity companies, but also the Government and the Electricity Authority. In all of its public comments the high cost of transmission has been NZAS's biggest bugbear (and has been for many years). The most recent public comments have focussed on the possibility of Transpower (NZ's grid owner and operator) providing some sort of discount.

Whilst from a regulatory perspective that is difficult to do, as it sets a precedent the regulator and Transpower will be unwilling to make, it may provide a pragmatic solution for the politicians.

Political considerations

Whilst there are several arguments each way, on balance we suspect the Labour and Greens are less concerned about closure than NZ First. In favour of closure from the Labour and Greens perspective is:

1) Lower NZ carbon emissions. Closing NZAS will reduce the direct carbon emissions from producing aluminium and would result in closure of thermal plant, reducing carbon emissions from the electricity sector. However, whilst this is true, from a global perspective carbon emissions will increase. Closing NZAS will have no impact on global aluminium demand, therefore, aluminium that was previously produced by NZAS will be produced offshore, most likely in a plant powered by coal — thereby increasing global emissions.

2) Lower electricity prices. Again, in our view, this argument is a fallacy. Whilst the energy component of electricity prices will fall, it is likely to be only temporary. Removing transmission constraints, closing of thermal plant and the attraction of energy intensive industries means electricity prices are likely to rebound within three to five years.

3) Optically, being seen to stand up to a large global company is likely to play well with many in the electorate.

The obvious political argument in support of keeping NZAS open is the negative effect on the Southland economy. NZ First is critical here as it has strong support from regional New Zealand. We believe that coalition dynamics in an election year is likely to see this argument win out, such that the Government will be willing to provide some modest support for NZAS.

A little bit of Government support, combined with a slightly more favourable electricity contract from CEN & MEL will help ensure RIO retains its NZAS option.

Contact Energy Limited (CEN)

Priced as at 31 Jan 2020 (NZ$)	**7.44**

12-month target price (NZ$)*	**7.85**
Expected share price return	5.5%
Net dividend yield	5.3%
Estimated 12-month return	10.8%

Spot valuations (NZ$)	
1. DCF	7.05
2. Market multiples	8.05
3. Dividend yield	8.54

Key WACC assumptions	
Risk free rate	2.00%
Equity beta	0.88
WACC	6.8%
Terminal growth	1.5%

DCF valuation summary (NZ$m)	
Total firm value	6,218
(Net debt)/cash	(1,108)
Less: Capitalised operating leases	
Value of equity	5,110

Profit and Loss Account (NZ$m)	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Sales revenue	2,275	2,519	2,220	2,265	2,206
Normalised EBITDA	**479**	**518**	**444**	**485**	**485**
Depreciation and amortisation	-	(205)	(202)	(201)	(199)
Normalised EBIT	**259**	**313**	**242**	**284**	**286**
Net interest	(84)	(70)	(59)	(59)	(60)
Depreciation capex adjustment	99	104	100	98	96
Tax	(48)	(72)	(51)	(63)	(63)
Minority interests	-	-	-	-	-
Adjusted normalised NPAT	**227**	**280**	**232**	**260**	**259**
Abnormals/other	(97)	65	(100)	(98)	(96)
Reported NPAT	**130**	**345**	**132**	**162**	**163**
Normalised EPS (cps)	31.7	39.2	32.4	36.3	36.1
DPS (cps)	32.0	39.0	39.0	39.5	40.0

Valuation Ratios	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
EV/EBITDA (x)	14.2	12.6	14.1	13.0	13.0
EV/EBIT (x)	26.3	20.8	25.9	22.2	22.0
PE (x)	23.4	19.0	22.9	20.5	20.6
Price/NTA (x)	2.3	2.3	2.4	2.5	2.7
Free cash flow yield (%)	5.6	6.3	4.4	5.4	5.4
Net dividend yield (%)	4.3	5.2	5.2	5.3	5.4
Gross dividend yield (%)	5.1	6.5	6.4	6.8	6.8

Capital Structure	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Interest cover EBIT (x)	3.3	4.8	4.5	5.2	5.2
Interest cover EBITDA (x)	5.7	7.4	7.6	8.2	8.1
Net debt/ND+E (%)	34.7	25.3	27.3	28.0	28.8
Net debt/EBITDA (x)	3.0	1.8	2.2	2.0	2.0

Growth Rates	**2018A**	**2019A**	**2020A**	**2021A**	**2022A**
Revenue (%)	9.4	10.7	-11.9	2.0	-2.6
EBITDA (%)	-4.4	8.1	-14.3	9.3	-0.1
EBIT (%)	-11.6	20.8	-22.7	17.5	0.5
Normalised NPAT (%)	9.1	23.4	-17.2	12.0	-0.5
Normalised EPS (%)	9.1	23.4	-17.2	12.0	-0.5
Ordinary DPS (%)	23.1	21.9	0.0	1.3	1.3

Key Ratios	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Return on assets (%)	4.9	9.8	5.0	6.1	6.3
Return on equity (%)	4.7	6.3	5.0	6.4	6.8
Return on funds employed (%)	4.5	9.4	4.8	5.8	6.1
EBITDA margin (%)	21.1	20.6	20.0	21.4	22.0
EBIT margin (%)	11.4	12.4	10.9	12.6	13.0
Capex to sales (%)	3.6	2.5	4.2	2.9	3.0
Capex to depreciation (%)	n/a	31	46	32	33
Imputation (%)	48	64	55	70	70
Pay-out ratio (%)	101	100	120	109	111

Cash Flow (NZ$m)	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
EBITDA	**479**	**518**	**444**	**485**	**485**
Working capital change	38	(19)	(6)	(7)	(1)
Interest & tax paid	(111)	(112)	(112)	(127)	(130)
Other	(27)	14	-	-	-
Operating cash flow	**379**	**401**	**327**	**351**	**355**
Capital expenditure	(82)	(63)	(93)	(65)	(66)
(Acquisitions)/divestments	6	382	-	-	-
Other	(7)	-	-	-	-
Funding available/(required)	**296**	**720**	**234**	**286**	**288**
Dividends paid	(201)	(251)	(279)	(279)	(283)
Equity raised/(returned)	1	-	-	-	-
(Increase)/decrease in net debt	**96**	**469**	**(46)**	**7**	**6**

Operating Performance	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Hydro generation (GWh)	3,479	4,232	3,887	3,887	3,887
Geothermal generation (GWh)	3,323	3,257	3,302	3,324	3,324
Thermal generation (GWh)	1,812	1,422	1,594	1,700	1,781
Total Generation (GWh)	**8,614**	**8,911**	**8,783**	**8,910**	**8,991**
GWAP ($/MWh)	85	129	111	101	88
Gas consumed (PJ)	17.5	13.9	15.0	15.9	16.6
Gas price ($/GJ)	6.1	7.1	7.9	8.1	8.2

Balance Sheet (NZ$m)	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Working capital	(22)	(3)	3	10	10
Fixed assets	4,253	4,126	4,017	3,881	3,748
Intangibles	441	425	425	425	425
Right of use asset	-	-	-	-	-
Other assets	404	132	132	132	132
Total funds employed	**5,076**	**4,680**	**4,577**	**4,448**	**4,315**
Net debt/(cash)	1,448	943	989	981	976
Lease liability	-	-	-	-	-
Other liabilities	901	955	950	941	931
Shareholder's funds	2,727	2,782	2,638	2,525	2,409
Minority interests	-	-	-	-	-
Total funding sources	**5,076**	**4,680**	**4,577**	**4,448**	**4,315**

Retail electricity volumes (GWh)	6,997	6,554	5,888	6,121	6,163
Electricity customers (000)	413	411	411	408	406
Average usage/customer (MWh)	8.7	8.6	8.6	8.6	8.6
Average retail price ($/MWh)	242	244	247	252	257
LWAP ($/MWh)	91	138	119	109	94
LWAP/GWAP	1.07	1.07	1.07	1.08	1.07
Retail gas volumes (PJ)	2.9	3.1	3.1	3.1	3.2
Gas customers (000)	65	67	66	66	66
Average gas sales price ($/GJ)	24.6	23.6	23.9	24.4	24.8

Genesis Energy Limited (GNE)

Priced as at 31 Jan 2020 (NZ$)	**3.15**

12-month target price (NZ$)*	**3.15**
Expected share price return	0.0%
Net dividend yield	5.6%
Estimated 12-month return	5.6%

Spot valuations (NZ$)	
1. DCF	2.73
2. Market multiple	3.01
3. Dividend yield	3.60

Key WACC assumptions	
Risk free rate	2.00%
Equity beta	0.88
WACC	6.8%
Terminal growth	1.5%

DCF valuation summary (NZ$m)	
Total firm value	4,117
(Net debt)/cash	(1,255)
Less: Capitalised operating leases	
Value of equity	2,862

Profit and Loss Account (NZ$m)	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Sales revenue	2,305	2,701	2,640	2,461	2,382
Normalised EBITDA	**361**	**363**	**362**	**407**	**449**
Depreciation and amortisation	(206)	(197)	(214)	(220)	(233)
Normalised EBIT	**155**	**167**	**148**	**188**	**216**
Net interest	(74)	(73)	(72)	(65)	(60)
Associate income	-	-	-	-	-
Tax	(22)	(27)	(21)	(34)	(44)
Deprecation capex adjustment	71	92	101	112	136
Adjusted normalised NPAT	**129**	**159**	**155**	**200**	**248**
Abnormals/other	(109)	(100)	(101)	(112)	(136)
Reported NPAT	**20**	**59**	**55**	**88**	**112**
Normalised EPS (cps)	12.8	15.5	15.0	19.1	23.6
DPS (cps)	16.9	17.1	17.4	17.7	18.0

Valuation Ratios	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
EV/EBITDA (x)	12.3	12.2	12.3	11.0	9.9
EV/EBIT (x)	28.7	26.5	30.0	23.8	20.7
PE (x)	24.7	20.3	21.0	16.5	13.4
Price/NTA (x)	2.0	1.8	1.9	2.0	2.1
Free cash flow yield (%)	4.9	5.0	5.8	6.9	7.9
Net dividend yield (%)	5.4	5.4	5.5	5.6	5.7
Gross dividend yield (%)	7.0	7.1	7.4	7.7	7.8

Growth Rates	**2018A**	**2019A**	**2020A**	**2021A**	**2022A**
Revenue (%)	18.1	17.2	-2.2	-6.8	-3.2
EBITDA (%)	5.9	0.8	-0.4	12.5	10.3
EBIT (%)	-2.0	7.8	-11.3	26.7	15.2
Normalised NPAT (%)	-18.9	23.5	-2.3	28.8	23.9
Normalised EPS (%)	-19.6	21.7	-3.3	27.4	23.3
Ordinary DPS (%)	1.8	0.9	1.8	1.7	1.7

Capital Structure	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Interest cover EBIT (x)	1.4	2.1	2.0	2.9	3.6
Interest cover EBITDA (x)	4.9	5.0	5.0	6.3	7.5
Net debt/ND+E (%)	37.7	35.5	37.2	36.6	35.4
Net debt/EBITDA (x)	3.3	3.3	3.4	2.8	2.4

Key Ratios	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Return on assets (%)	2.4	3.4	3.3	4.3	5.2
Return on equity (%)	3.0	3.1	2.6	4.4	5.7
Return on funds employed (%)	3.6	3.6	3.2	4.3	5.1
EBITDA margin (%)	15.6	13.5	13.7	16.6	18.9
EBIT margin (%)	6.7	6.2	5.6	7.6	9.1
Capex to sales (%)	4.7	2.5	2.8	2.6	2.4
Capex to depreciation (%)	52	35	35	29	24
Imputation (%)	80	80	90	95	95
Pay-out ratio (%)	132	110	116	92	76

Cash Flow (NZ$m)	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
EBITDA	**361**	**363**	**362**	**407**	**449**
Working capital change	33	(27)	7	(2)	(9)
Interest & tax paid	(120)	(123)	(108)	(117)	(128)
Other	(7)	17	-	-	-
Operating cash flow	**266**	**231**	**261**	**288**	**313**
Capital expenditure	(108)	(69)	(74)	(64)	(57)
(Acquisitions)/divestments	0	(0)	-	-	-
Other	-	-	-	-	-
Funding available/(required)	**159**	**162**	**187**	**224**	**256**
Dividends paid	(148)	(132)	(139)	(143)	(167)
Equity raised/(returned)	(1)	(1)	-	-	-
(Increase)/decrease in net debt	**10**	**29**	**49**	**81**	**89**

Operating Performance	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Renewable generation	3,084	2,835	2,742	2,716	2,716
Gas generation	3,392	2,586	2,785	2,787	2,787
Coal generation	657	1,410	1,102	876	876
Total GNE generation (GWh)	**7,133**	**6,831**	**6,629**	**6,380**	**6,380**
GWAP ($/MWh)	92	143	123	110	96
Retail electricity					
Electricity customers (000)	504	499	495	490	488
MM/SME volumes	4,169	4,077	4,097	4,078	4,056
TOU volumes	1,811	1,992	2,037	2,058	2,078
Total fixed price volumes (GWh	**5,980**	**6,068**	**6,135**	**6,135**	**6,135**
Average MM usage/cust (kWh/yr)	8,240	8,126	8,237	8,279	8,308
Average FPVV price ($/MWh)	206	207	212	215	217
LWAP ($/MWh)	92	139	122	112	97
LWAP/GWAP	1.01	0.97	0.99	1.01	1.01
Line losses (%)	5.3	5.4	5.6	5.6	5.6
Kupe production					
Gas production (PJ)	11.8	11.8	11.2	11.1	11.7
Oil production (k barrels)	532.8	472.9	395.0	382.4	555.8
LPG production (k tonnes)	45.9	50.6	49.4	49.5	52.7
Kupe EBITDAF ($m)	115.3	108.8	104.5	107.8	127.2
Energy EBITDAF ($m)	245.2	254.6	257.5	299.6	322.3
GNE EBITDAF ($m)	**360.5**	**363.4**	**362.1**	**407.4**	**449.5**

Balance Sheet (NZ$m)	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Working capital	90	111	104	106	115
Fixed assets	3,430	3,717	3,661	3,526	3,359
Intangibles	364	364	368	362	355
Right of use asset	-	-	-	-	-
Other assets	84	121	121	121	121
Total funds employed	**3,968**	**4,313**	**4,253**	**4,116**	**3,950**
Net debt/(cash)	1,206	1,228	1,267	1,201	1,114
Lease liability	-	-	-	-	-
Other liabilities	806	934	920	902	878
Shareholder's funds	1,956	2,151	2,067	2,012	1,958
Minority interests	-	-	-	-	-
Total funding sources	**3,968**	**4,313**	**4,253**	**4,116**	**3,950**

Mercury NZ Limited (MCY)

Priced as at 31 Jan 2020 (NZ$)	**5.24**

12-month target price (NZ$)*	**4.60**
Expected share price return	-12.2%
Net dividend yield	3.1%
Estimated 12-month return	-9.1%

Spot valuations (NZ$)	
1. DCF	4.23
2. Market multiple	5.00
3. Dividend yield	4.53

Key WACC assumptions	
Risk free rate	2.00%
Equity beta	0.88
WACC	6.8%
Terminal growth	1.5%

DCF valuation summary (NZ$m)	
Total firm value	7,074
(Net debt)/cash	(1,223)
Less: Capitalised operating leases	
Value of equity	5,852

Profit and Loss Account (NZ$m)	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Sales revenue	1,798	2,000	1,865	1,787	1,732
Normalised EBITDA	**566**	**505**	**511**	**523**	**552**
Depreciation and amortisation	(201)	(204)	(197)	(200)	(203)
Normalised EBIT	**365**	**301**	**314**	**322**	**349**
Net interest	(91)	(75)	(66)	(69)	(74)
Associate income	2	1	-	-	-
Tax	(91)	(73)	(71)	(73)	(79)
Depreciation capex adj	58	78	67	91	91
Adjusted normalised NPAT	**256**	**239**	**243**	**272**	**287**
Abnormals/other	(7)	118	(67)	(91)	(91)
Reported NPAT	**249**	**357**	**176**	**180**	**196**
Normalised EPS (cps)	18.8	17.6	17.9	20.0	21.1
DPS (cps)	15.1	15.5	15.8	16.2	18.7

Valuation Ratios	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
EV/EBITDA (x)	14.4	15.9	15.6	15.4	14.5
EV/EBIT (x)	22.1	26.6	25.4	24.9	23.0
PE (x)	27.9	29.8	29.3	26.3	24.9
Price/NTA (x)	2.2	2.1	2.1	2.1	2.1
Free cash flow yield (%)	3.5	2.9	1.4	1.2	3.0
Net dividend yield (%)	2.9	3.0	3.0	3.1	3.6
Gross dividend yield (%)	4.0	4.1	4.2	4.3	4.9

Growth Rates	**2018A**	**2019A**	**2020A**	**2021A**	**2022A**
Revenue (%)	12.6	11.2	-6.8	-4.2	-3.0
EBITDA (%)	8.2	-10.8	1.2	2.3	5.7
EBIT (%)	7.9	-17.7	3.9	2.7	8.3
Normalised NPAT (%)	1.8	-6.5	1.7	11.7	5.6
Normalised EPS (%)	2.9	-6.4	1.7	11.7	5.6
Ordinary DPS (%)	3.4	2.6	1.9	2.5	15.4

Capital Structure	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Interest cover EBIT (x)	4.7	6.7	4.7	4.7	4.7
Interest cover EBITDA (x)	6.2	6.7	7.7	7.6	7.5
Net debt/ND+E (%)	70.8	61.8	65.3	69.0	70.3
Net debt/EBITDA (x)	2.2	2.2	2.4	2.6	2.5

Key Ratios	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Return on assets (%)	7.1	7.8	4.8	4.9	5.3
Return on equity (%)	6.0	4.6	5.0	5.2	5.7
Return on funds employed (%)	5.8	4.7	4.8	4.8	5.2
EBITDA margin (%)	31.5	25.3	27.4	29.3	31.9
EBIT margin (%)	20.4	15.1	16.8	18.0	20.1
Capex to sales (%)	7.1	6.1	16.1	13.6	8.7
Capex to depreciation (%)	69	67	164	131	79
Imputation (%)	100	100	100	100	95
Pay-out ratio (%)	80	88	88	81	89

Cash Flow (NZ$m)	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
EBITDA	**566**	**505**	**511**	**523**	**552**
Working capital change	4	2	45	(33)	(20)
Interest & tax paid	(192)	(148)	(156)	(160)	(172)
Other	(4)	(33)	-	-	-
Operating cash flow	**374**	**326**	**400**	**330**	**361**
Capital expenditure	(127)	(122)	(299)	(244)	(150)
(Acquisitions)/divestments	(139)	215	-	-	-
Other	1	12	(2)	(3)	(3)
Funding available/(required)	**109**	**431**	**98**	**83**	**208**
Dividends paid	(273)	(208)	(212)	(218)	(225)
Equity raised/(returned)	(50)	-	-	-	-
(Increase)/decrease in net debt	**(214)**	**223**	**(114)**	**(134)**	**(17)**

Operating Performance	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Hydro	4,947	4,006	4,050	4,016	4,016
Geothermal	2,757	2,894	2,795	2,843	2,843
Wind	-	-	-	181	562
Total MCY Generation (GWh)	**7,704**	**6,900**	**6,845**	**7,040**	**7,421**
GWAP ($/MWh)	86	139	121	107	93
Electricity sales					
Electricity customers (000)	388	373	352	349	345
MM volumes	3,278	3,182	2,910	2,843	2,821
TOU volumes	1,200	1,319	1,460	1,519	1,527
Total Fixed Price volumes (GWI	**4,478**	**4,501**	**4,370**	**4,363**	**4,347**
Spot Sales	891	780	729	732	736
Net CFD's	2,110	1,665	1,775	1,775	1,775
Total Sales (GWh)	**7,479**	**6,946**	**6,874**	**6,870**	**6,858**
Average usage per cust (MWh/yr)	11.4	11.8	12.2	12.4	12.5
LWAP ($/MWh)	92	145	126	113	98
LWAP/GWAP	1.06	1.04	1.04	1.05	1.06
Average FPVV price ($/MWh)	113	113	115	117	119
Line losses (%)	5.6	5.1	5.1	5.3	5.3
Energy margin ($m)	730	667	695	705	742
Operating costs ($m)	(205)	(199)	(203)	(202)	(210)
Other revenue ($m)	41	37	19	20	20
MCY EBITDAF ($m)	**566**	**505**	**511**	**523**	**552**

Balance Sheet (NZ$m)	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Working capital	63	63	18	51	71
Fixed assets	5,370	5,528	5,635	5,686	5,640
Intangibles	85	62	59	57	55
Right of use asset	-	-	-	-	-
Other assets	385	521	523	526	529
Total funds employed	**5,903**	**6,174**	**6,236**	**6,319**	**6,294**
Net debt/(cash)	1,264	1,096	1,210	1,345	1,362
Lease liability	-	-	-	-	-
Other liabilities	1,306	1,498	1,482	1,468	1,455
Shareholder's funds	3,333	3,580	3,544	3,506	3,478
Minority interests	-	-	-	-	-
Total funding sources	**5,903**	**6,174**	**6,236**	**6,319**	**6,294**

Meridian Energy Limited (MEL)

Priced as at 31 Jan 2020 (NZ$)	**5.34**

12-month target price (NZ$)*	**4.40**
Expected share price return	-17.7%
Net dividend yield	4.1%
Estimated 12-month return	-13.6%

Spot valuations (NZ$)	
1. DCF	3.74
2. Market multiple	4.72
3. Dividend yield	4.62

Key WACC assumptions	
Risk free rate	2.00%
Equity beta	0.84
WACC	6.8%
Terminal growth	1.5%

DCF valuation summary (NZ$m)	
Total firm value	11,359
(Net debt)/cash	(1,761)
Less: Capitalised operating leases	
Value of equity	9,598

Profit and Loss Account (NZ$m)	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Sales revenue	3,297	4,104	3,580	3,596	3,478
Normalised EBITDA	**666**	**838**	**863**	**808**	**806**
Depreciation and amortisation	(21)	(276)	(309)	(302)	(296)
Normalised EBIT	**398**	**562**	**553**	**506**	**510**
Net interest	(81)	(83)	(78)	(77)	(79)
Associate income & other	(19)	(14)	(17)	(19)	(19)
Tax	(95)	(133)	(128)	(115)	(115)
Minority interests	-	-	-	-	-
Reported NPAT	**203**	**332**	**330**	**295**	**297**
Abnormals/other	158	149	183	177	171
Adjusted normalised NPAT	**361**	**481**	**513**	**472**	**468**
Normalised EPS (cps)	14.1	18.8	20.0	18.4	18.3
DPS (cps)	19.2	21.3	21.5	21.9	21.2

Valuation Ratios	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
EV/EBITDA (x)	22.5	18.1	17.5	18.8	18.8
EV/EBIT (x)	37.7	26.9	27.4	29.9	29.7
PE (x)	38.0	28.5	26.7	29.0	29.3
Price/NTA (x)	2.9	2.5	2.6	2.8	2.9
Free cash flow yield (%)	1.3	4.1	3.8	3.7	3.7
Net dividend yield (%)	3.6	4.0	4.0	4.1	4.0
Gross dividend yield (%)	4.5	5.0	5.0	5.1	5.0

Capital Structure	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Interest cover EBIT (x)	4.7	6.6	6.9	6.3	6.2
Interest cover EBITDA (x)	8.2	10.1	11.1	10.4	10.2
Net debt/ND+E (%)	71.3	76.9	87.5	103.7	126.3
Net debt/EBITDA (x)	2.2	1.7	1.7	1.9	1.9

Growth Rates	**2018A**	**2019A**	**2020A**	**2021A**	**2022A**
Revenue (%)	16.7	24.5	-12.8	0.5	-3.3
EBITDA (%)	1.4	25.8	3.0	-6.4	-0.3
EBIT (%)	1.3	41.2	-1.5	-8.6	0.7
Normalised NPAT (%)	-3.1	33.4	6.7	-8.1	-0.8
Normalised EPS (%)	-3.1	33.4	6.7	-8.1	-0.8
Ordinary DPS (%)	1.5	10.9	1.1	1.8	-3.2

Key Ratios	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Return on assets (%)	4.4	5.7	5.7	5.4	5.5
Return on equity (%)	4.3	6.1	6.3	5.9	6.3
Return on funds employed (%)	4.6	5.9	6.0	5.6	5.8
EBITDA margin (%)	20.2	20.4	24.1	22.5	23.2
EBIT margin (%)	12.1	13.7	15.5	14.1	14.7
Capex to sales (%)	7.5	1.7	2.1	2.1	1.7
Capex to depreciation (%)	n/a	28	27	27	21
Imputation (%)	68	66	65	65	70
Pay-out ratio (%)	136	113	107	119	116

Cash Flow (NZ$m)	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
EBITDA	**666**	**838**	**863**	**808**	**806**
Working capital change	(34)	(36)	(4)	24	14
Interest & tax paid	(186)	(200)	(247)	(233)	(236)
Other	(19)	33	(17)	(19)	(19)
Operating cash flow	**427**	**635**	**595**	**580**	**565**
Capital expenditure	(247)	(69)	(75)	(76)	(58)
(Acquisitions)/divestments	23	-	-	-	-
Other	-	-	-	-	-
Funding available/(required)	**203**	**566**	**519**	**503**	**507**
Dividends paid	(486)	(500)	(551)	(557)	(569)
Equity raised/(returned)	(2)	(2)	-	-	-
(Increase)/decrease in net debt	**(285)**	**64**	**(32)**	**(53)**	**(62)**

Operating Performance	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Hydro generation	11,266	12,326	12,626	11,946	11,701
Wind generation	1,263	1,244	1,491	1,474	1,474
Total NZ generation (GWh)	**12,528**	**13,570**	**14,117**	**13,419**	**13,175**
GWAP ($/MWh)	83	123	97	98	87
Overseas generation (GWh)	581	730	698	809	809
Overseas GWAP ($/MWh) (NZD)	151	100	136	102	92
Overseas customer numbers (00(	97	110	133	150	161
NZ electricity customers (000)	**291**	**302**	**317**	**323**	**330**
Average usage per cust (MWh/yr)	13.5	13.2	13.3	13.2	13.2
Mass market volumes	3,824	3,901	4,116	4,226	4,315
Time of use volumes	2,157	2,338	2,874	2,897	2,921
Total fixed price volumes (GWh	**5,981**	**6,239**	**6,990**	**7,124**	**7,236**
NZAS sales	5,011	5,310	5,464	5,449	5,449
Sell CFDs	2,278	2,239	1,756	1,806	1,806
Buy CFDs	(2,222)	(1,965)	(1,988)	(1,790)	(1,790)
Total Sales (GWh)	**11,047**	**11,823**	**12,222**	**12,588**	**12,701**
Average FPVV price ($/MWh)	105	105	107	110	111
LWAP ($/MWh)	88	132	106	105	93
LWAP/GWAP	1.06	1.07	1.09	1.07	1.07
Lines losses (%)	5.3	5.9	5.1	5.5	5.5

Balance Sheet (NZ$m)	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Working capital	(17)	(24)	(3)	(8)	(3)
Fixed assets	7,941	8,825	8,599	8,377	8,139
Intangibles	60	59	51	47	47
Right of use asset	-	-	-	-	-
Other assets	291	383	366	347	328
Total funds employed	**8,275**	**9,243**	**9,013**	**8,763**	**8,511**
Net debt/(cash)	1,461	1,424	1,456	1,509	1,571
Lease liability	-	-	-	-	-
Other liabilities	1,991	2,362	2,321	2,280	2,238
Shareholder's funds	4,823	5,457	5,236	4,975	4,702
Minority interests	-	-	-	-	-
Total funding sources	**8,275**	**9,243**	**9,013**	**8,763**	**8,511**

Trustpower Ltd (TPW)

Priced as at 31 Jan 2020 (NZ$)	**7.50**

12-month target price (NZ$)*	**7.75**
Expected share price return	3.3%
Net dividend yield	4.5%
Estimated 12-month return	7.9%

Spot valuations (NZ$)	
1. DCF	7.38
2. Market multiples	7.58
3. Dividend Yield	7.92

Key WACC assumptions	
Risk free rate	2.00%
Equity beta	0.88
WACC	6.6%
Terminal growth	1.5%

DCF valuation summary (NZ$m)	
Total firm value	2,984
(Net debt)/cash	(634)
Less: Capitalised operating leases	
Value of equity	2,334

Profit and Loss Account (NZ$m)	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Sales revenue	979	1,030	1,000	994	994
Normalised EBITDA	**270**	**222**	**203**	**209**	**220**
Depreciation and amortisation	(16)	(47)	(39)	(40)	(40)
Normalised EBIT	**223**	**175**	**164**	**169**	**179**
Net interest	(34)	(28)	(35)	(35)	(35)
Depreciation capex adjustment	8	19	9	11	11
Tax	(55)	(48)	(40)	(42)	(44)
Minority interests	(1)	(2)	(2)	(2)	(2)
Normalised NPAT	**141**	**117**	**96**	**103**	**109**
Abnormals/other/depn adj	(13)	(26)	(17)	(8)	(8)
Reported NPAT	**128**	**91**	**79**	**94**	**101**
Normalised EPS (cps)	44.9	37.1	30.5	32.7	34.9
DPS (cps)	34.0	74.0	34.0	34.0	35.0

Valuation Ratios	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
EV/EBITDA (x)	10.9	12.9	14.6	14.4	13.7
EV/EBIT (x)	13.2	16.4	18.1	17.8	16.8
PE (x)	16.7	20.2	24.6	23.0	21.5
Price/NTA (x)	1.7	2.0	2.1	2.1	2.1
Free cash flow yield (%)	7.1	3.8	2.9	4.7	5.3
Net dividend yield (%)	4.5	9.9	4.5	4.5	4.7
Gross dividend yield (%)	6.3	12.0	6.3	6.3	6.5

Capital Structure	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Interest cover EBIT (x)	7.0	6.8	5.0	5.2	5.4
Interest cover EBITDA (x)	7.9	7.9	5.9	6.0	6.2
Net debt/ND+E (%)	48.9	58.6	66.9	67.6	67.6
Net debt/EBITDA (x)	1.7	2.5	3.2	3.1	2.9

Growth Rates	**2018A**	**2019A**	**2020A**	**2021A**	**2022A**
Revenue (%)	4.2	5.2	-2.9	-0.6	0.0
EBITDA (%)	15.0	-17.6	-8.6	3.0	5.0
EBIT (%)	19.3	-21.6	-6.5	3.6	5.8
Normalised NPAT (%)	8.5	-17.3	-17.8	7.1	6.7
Normalised EPS (%)	8.5	-17.3	-17.8	7.1	6.7
Ordinary DPS (%)	3.0	0.0	0.0	0.0	2.9

Key Ratios	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Return on assets (%)	9.2	7.2	6.6	7.6	8.1
Return on equity (%)	9.9	9.7	8.5	9.3	9.9
Return on funds employed (%)	8.5	7.2	6.5	6.6	7.1
EBITDA margin (%)	27.5	21.6	20.3	21.0	22.1
EBIT margin (%)	22.8	17.0	16.4	17.0	18.0
Capex to sales (%)	4.2	3.0	3.1	2.9	2.9
Capex to depreciation (%)	n/a	98	104	97	99
Imputation (%)	100	55	100	100	100
Pay-out ratio (%)	76	199	111	104	100

Cash Flow (NZ$m)	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
EBITDA	**270**	**222**	**203**	**209**	**220**
Working capital change	25	(47)	(41)	3	9
Interest & tax paid	(64)	(75)	(83)	(73)	(76)
Other	(23)	20	20	-	-
Operating cash flow	**208**	**120**	**99**	**140**	**152**
Capital expenditure	(42)	(31)	(31)	(28)	(29)
(Acquisitions)/divestments	118	8	-	-	-
Other	4	(2)	-	-	-
Funding available/(required)	**288**	**96**	**68**	**111**	**123**
Dividends paid	(110)	(190)	(154)	(106)	(108)
Equity raised/(returned)	(0.5)	-	-	-	-
(Increase)/decrease in net debt	**178**	**(95)**	**(85)**	**5**	**15**

Operating Performance	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
NZ electricity revenue	810	861	828	822	814
Gas revenue	29	29	30	32	34
Telecommunication revenue	81	88	92	96	103
Other revenue	60	52	50	45	44
Total revenue	**979**	**1,030**	**1,000**	**994**	**994**
Generation (GWh)	2,235	1,995	1,815	1,896	1,896
NZ GWAP ($/MWh)	88	125	118	106	86
Mass market sales (GWh)	1,887	1,845	1,794	1,791	1,782
TOU sales (GWh)	842	880	866	869	872
Spot sales (GWh)	1,086	1,021	1,034	1,037	1,041
Total Sales (GWh)	**3,815**	**3,746**	**3,693**	**3,696**	**3,694**
LWAP ($/MWh)	91	131	124	113	93
LWAP/GWAP	1.04	1.04	1.05	1.07	1.07
Electricity customers (000)	273	267	265	264	263
Usage/customer (MWh)	6.9	6.8	6.7	6.8	6.8
Revenue/MWh sold ($)	212	230	224	222	220
Gas customers (000)	37	39	41	42	43
Volume/customer (GJ)	27.5	26.5	24.5	24.5	24.5
Telco customers (000)	87	96	104	111	116
Revenue/customer ($)	991	963	959	968	978

Balance Sheet (NZ$m)	**2018A**	**2019A**	**2020E**	**2021E**	**2022E**
Working capital	(28)	(0)	24	24	25
Fixed assets	2,102	1,925	1,913	1,899	1,884
Intangibles	44	37	40	43	46
Right of use asset	-	-	-	-	-
Other assets	60	115	173	170	161
Total funds employed	**2,178**	**2,076**	**2,151**	**2,136**	**2,116**
Net debt/(cash)	467	557	646	641	626
Lease liability	-	-	-	-	-
Other liabilities	276	270	314	315	315
Shareholder's funds	1,413	1,224	1,165	1,153	1,147
Minority interests	22	25	25	27	28
Total funding sources	**2,178**	**2,076**	**2,151**	**2,136**	**2,116**